Army Research on Non-cognitive Predictors

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New Predictor Research

- Attrition screening of non-high school diploma graduates
  - Temperament measures (AIM)
- Select21
  - Temperament measures (rational biodata, WSI)
  - Person-environment fit measures
  - Situational Judgment Test
- In-service applications: Some examples
  - NCO21 (AIM, rational biodata, SJT)
  - Special Forces research (rational biodata, AIM)
  - Recruiter screening (AIM, rational biodata)
  - Explosive Ordnance Disposal trainees (AIM)

Assessment of Individual Motivation (AIM)

- Self report measure of Adjustment, Physical Conditioning, Leadership, Work Orientation, Agreeableness, and Dependability (Maturity)
  - Measures constructs from Project A ABLE; 30 minutes
- Uses multidimensional forced-choice format to increase resistance to gaming/faking
  - Unlikely virtues scale to adjust for inaccuracies due to faking
- AIM scales have low correlations with gender and race/ethnic group

Assessment of Individual Motivation (AIM)

- Predicts motivational and adaptability components of performance
  - Attrition, Effort and Leadership, Personal Discipline, Fitness
  - Incremental validity over ASVAB and educational attainment for predicting these types of criteria

- AIM Research Findings: Examples
  - Predicts NCO performance and one-year promotion attainment
  - Predicts duty performance of Correctional Specialists, Special Forces, Drill Sergeants, and Recruiters
  - Predicts Explosive Ordnance Disposal Trainees' course performance and attrition

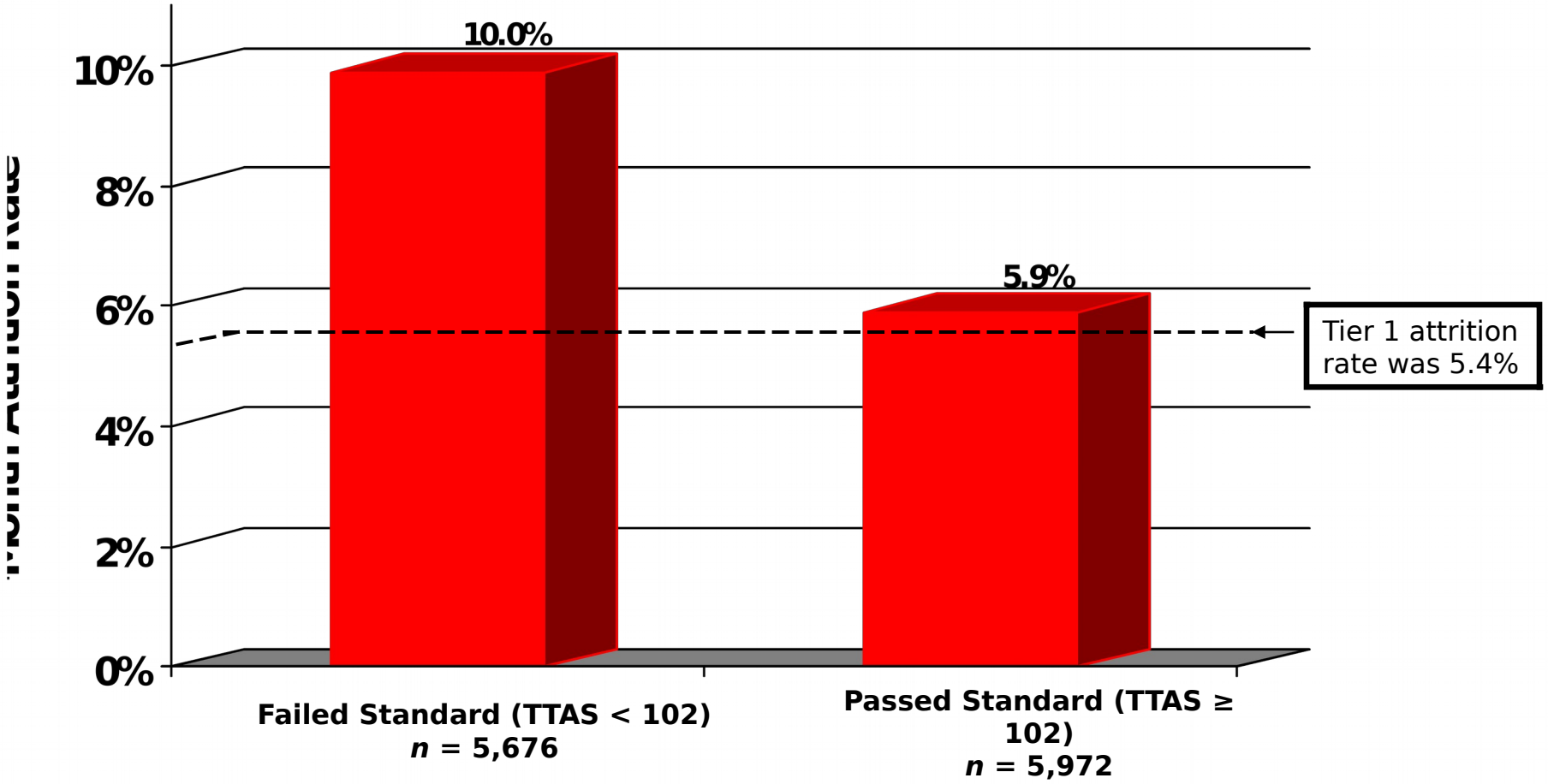
Tier Two Attrition Screen (TTAS)

- ARI Tier Two Attrition Screen (TTAS)
  - Combines AIM, ASVAB, and Body Mass Index measures for a “whole person” assessment
  - Predicts non-high school diploma graduate (NHSDG) enlisted attrition
  - Implemented in April 2005; continues to end of FY07

- TTAS Program ...
  - Exempts TTAS-qualified NHSDG from counting against OSD’s 10% cap on NHSDG accessions; 6,000 in FY06
  - Allows Tier 1 incentives for TTAS-qualified NHSDG in Tier 2
  - Applies to all Regular Army, USAR, and ARNG applicants
  - 5,000 Tier 1 to be tested on AIM for research purposes

6-Month Validation Findings For GEDs (*n* = 11,648)

Source: U.S. Army Research Institute (ARI)



Note: The overall attrition rate for the full GED sample is 7.9%

Select21: Research Objectives

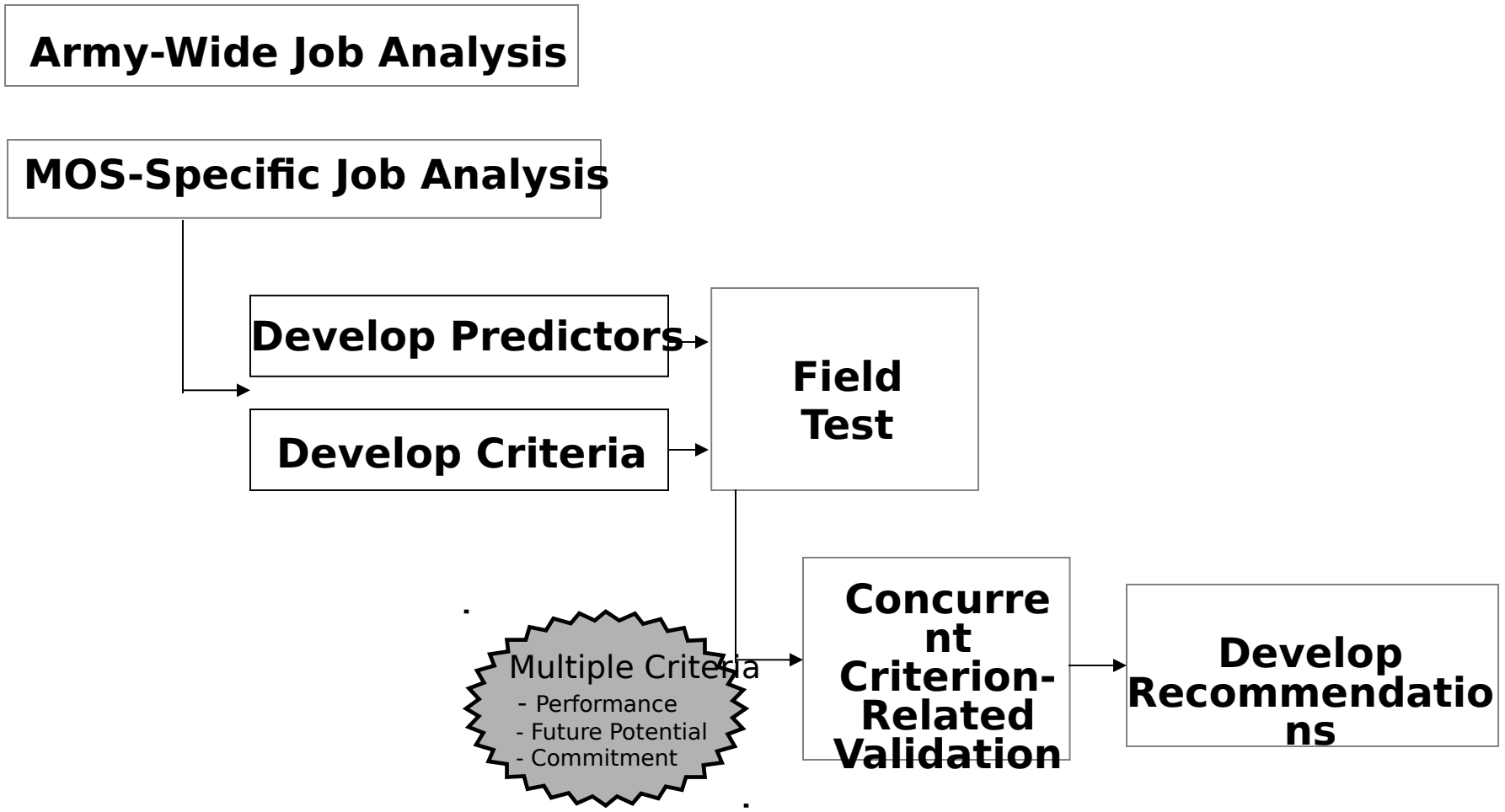
- Develop and validate measures of critical knowledge, skills, and abilities (KSAs) needed by entering Soldiers for successful execution of jobs in the future operational environment

- Develop and validate measures of recruits' fit to the current and anticipated future Army environments to identify Soldiers at risk for attrition now and in the future

- Propose use of these measures as a foundation for an improved entry-level selection and classification system
  - Develop measures that can increment prediction of Soldier performance over current quality indicators (e.g., ASVAB, education)

Select 21: Selection and Classification of the Future Force Soldier

Summary of Research Design



Select21: Predictor Measures

- Temperament measures
  - Work Suitability Inventory (WSI)
  - Rational Biodata Inventory (RBI)
- Person-environment fit measures
  - Work Values Inventory (WVI)
  - Work Preferences Survey (WPS)
- Predictor Situational Judgment Test (PSJT)
- Psychomotor Tests
- *Developed but not used in concurrent validation*
  - Three “expectations” measures
  - Record of Pre-Enlistment Training & Experience (REPETE)

  - **See handout showing KSA-predictor linkages.**

Select21: Validation Strategy

- Concurrent Validation (*n* = 812)
  - Administered predictors and criterion measures to Soldiers with between 18-36 months in service (Apr 2005 – Jan 2006)
  - Multiple validation samples (see handout for sample descriptions)
    - Army-wide (mix of MOS)
    - Close Combat sample (11B)
    - Surveillance, Intelligence, and Communication sample (31U/25U)
- Attrition Database
  - Evaluate validity of measures for predicting attrition (BCT to Unit)
  - Three cohort samples comprise new recruits who completed the measures during instrument development and field testing

Select 21: Primary Criterion Scores

- Performance Criteria
  - GTP: General Technical Proficiency (Job Knowledge Test, Admin, Ratings)
  - AE: Achievement and Effort (Admin, Ratings)
  - PF: Physical Fitness (Admin, Ratings)
  - TEAM: Teamwork (Ratings)
  - FXP: Future Expected Performance (Ratings)
- Attitudinal Criteria (all self-report)
  - ASat: Satisfaction with the Army
  - AFit: Perceived Army Fit
  - CInt: Career Intentions
  - ACog: Attrition Cognitions
  - FAA: Future Army Affect

Select21: Person-Environment (P-E) Fit Predictors

- Work Values Inventory (p. 11)
- Work Preferences Survey (p. 12)
- Marker Variable: CEP-II (p. 13)
- Expectations Measures (p. 14)
  - Not administered in concurrent validation

Page numbers refer to Product Report (2006-01)

Work Values Inventory (WVI)

- Designed to measure importance placed on reinforcers potentially received in a job/work setting (e.g., physical activity, autonomy)

- Reinforcers drawn from Davis & Lofquist's (1984) taxonomy of work values or designed specifically for Select21 (e.g., based on results of recent attrition work)

- Scores based on the WIQ/WIP algorithm (Gay et al., 1971; McCloy et al., 1999)

Work Preferences Survey (WPS)

- Interest inventory based on Holland's six types of occupations
  - Realistic
  - Investigative
  - Artistic
  - Social
  - Enterprising
  - Conventional
- Items describe work activities, work environments, and learning opportunities reflecting RIASEC job types
- Supply-side information collected from NCOs

Predictor SJT (PSJT)

- Problem scenarios based on experiences in early training (first few months in the Army)
  - Civilian scenarios developed to mimic military critical incidents (see p. 9 of product report)
- Respondents rate effectiveness of four response options
- Yields a single score

Select21: Temperament Measure Work Suitability Inventory (WSI)

- Respondents rank 16 statements based on how successfully they believe they could perform the type of work described
- Work style statements drawn from O*NET
- See p. 5 of product report for illustration
- Idea is to develop multiple scoring approaches for predicting alternate criteria (e.g., attrition, job performance)

Select21: Temperament Measures
Rational Biodata Inventory

- Rational Biodata Inventory (RBI)
  - Self-report, multiple-choice temperament measure
  - Assesses prior behavior, experiences, reactions
  - 10 dimensions (e.g., Peer Leadership, Interpersonal Skills, Stress Tolerance)

- See p. 3 of product report for sample item

Select21: Validation Results

- See handout, Table 13.1

Select21: Prediction of Attrition

- Empirically optimized composites, targeted to each attrition period (BCT, AIT, IET, Unit, 15-month) were created for several measures

- Results positive
  - RBI (.14 - .24)
  - WSI (.14 - .22)
  - WPS (.06 - .14)
  - WVI (.11 - .18)

In-Service Applications: Some Examples

- NCO21
  - AIM and biodata scales related to multiple measures of junior NCO leadership; incremental validity over SGT/SSG promotion index used by the Army
- Special Forces Performance
  - A combination of some rational biodata subscales, known as TAP, is currently used to predict enlisted SF performance on deployments

In-Service Applications: Some Examples

- Recruiter Screening
  - A combination of AIM and rational biodata scales, known as Noncommissioned Officer Leadership Skills Inventory (NLSI), used to predict production of Army recruiters
  - NSLI also shown to be related to measures of Drill Sergeant performance

- Explosive Ordnance Disposal
  - AIM shown to predict graduation and GPA at Navy EOD school

Future Directions: Validating Future Force Performance Measures (Army Class)

- ARI project (FY06-10) designed to validate non-cognitive predictors in an operational context with emphasis on differential validity, classification, and reclassification
- Initial timeline

FY06	Quick study for measure development with 1st term Soldiers
FY07	Collect non-cognitive data at MEPS stations/reception battalions from ~8,000 recruits
FY07/08	Collect and analyze training performance and attrition data
FY09	Collect performance, attitudes, and attrition data
FY10	Results and recommendations

Future Directions

Non-cognitive measures:

- Can predict valued outcomes (e.g., attrition, performance, career intentions)
- Are being examined for augmenting ASVAB and other operational measures in the Soldier selection and classification process
- Need operational tryouts of emerging motivational measures in high stakes contexts to establish test utility

- Distortion of self-report information is a concern and strategies to manage faking are critical to success
- Major advantages seen for transition to computerized testing at MEPS for AIM and other new predictor measures
- Alternative test construction and Item-Response Theory approaches continue to be investigated
  - SBIR Phase II with Drasgow Consulting Group